# Residential Wood Heaters

## New Source Performance Standards (NSPS)

Public Outreach on Draft Proposed Rule

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# EPA Point of Contact

Gil Wood, Project Lead
919-541-5272
wood.gil@epa.gov

# Where are we in the process of creating a rule to control air pollution from new wood-fired heaters?

- Draft* proposal package being reviewed internally
- Draft should be ready to start normal 90-day review by other federal agencies by March 2012
- Anticipated schedule:
  - Summer 2012 – Proposed rule to be signed by EPA Administrator and published in *Federal Register* and on-line
  - 90-day public comment period – Opportunity for people to submit information for EPA to consider as we develop the final rule. Information on how to comment will be on the website when we propose the rule.
  - If requested, a public hearing will be held during the comment period
  - Summer 2013 – Final rule to be signed by EPA Administrator and published in *Federal Register* and on-line

***** Proposal is still draft and subject to change pending EPA Administrator's review and signature on rulemaking proposal in *Federal Register* for public comment

# Background

- EPA authority for regulating new sources is under Section 111 of the Clean Air Act – emission standards that reflect Best Systems of Emission Reduction (taking costs into account) that the Administrator has determined to be adequately demonstrated

- The current rule (issued in 1988) covering emissions from wood-burning residential heaters requires manufacturers to design new residential wood heaters to meet particulate emission (PM) limits, have representative heaters (per model line) tested by an EPA-accredited lab, and attach EPA label after EPA approval

- Current rule also requires operation according to owner's manual

- Not for existing wood-burning devices

# Wood Smoke Fine Particle Emissions Are Significant

| | Fine Particle Emissions |
|---|---|
| • 2008 National Emission Inventory: | 2,449,000 tons |
| • 2008 Residential Wood Combustion: | 318,000 tons (13%) |

# Wood Smoke Can Cause Significant Health Effects

- Residential wood smoke can increase particle pollution to levels that cause significant health concerns (e.g., asthma attacks, heart attacks, premature death).

- Several areas with wood smoke problems either exceed EPA's health-based standards or are on the cusp of exceeding those standards.

- For example, residential wood smoke contributes 25 percent of the wintertime particle pollution problem in Keene, New Hampshire.

- Wood smoke makes up more than 50 percent of the wintertime particle pollution problem in Sacramento, California, and Tacoma, Washington.

# Many Requests for Standards for Hydronic Heaters, aka Outdoor Wood Boilers

- Petition from 6 northeastern states plus Michigan and Northeast States for Coordinated Air Use Management

- Request from the Hearth, Patio, and Barbecue Association Outdoor Wood-fired Hydronic Heater Caucus

- Numerous calls and emails from neighbors and others concerned about health effects. Note: The proposal will not control emissions from existing wood-burning devices. The EPA authority for this rule is for control of new sources. Numerous states and local jurisdictions do regulate existing devices, however.

# Our Initial Efforts to Reduce Emissions from Hydronic Heaters, aka Outdoor Wood Boilers:

- EPA developed a voluntary program to encourage manufacturers to redesign their models to reduce emissions-- faster than an EPA regulation
  - Phase 1 rolled out January 2007
  - 22 Phase 1 partners, 12 Phase 1 qualified models (>70% reduction in emissions)
- We provided technical and financial support for the Northeast States for Coordinated Air Use Management to develop a "model rule"…
  - Most of the northeast states and some other states used the model rule as the starting point for adopting state rules to control emissions from certain wood-fired devices
- We developed Phase 2 of the voluntary program and a BurnWise education program to further reduce emissions
  - Phase 2 started in October 2008
  - 24 Phase 2 partners, 27 Phase 2 qualified models (90% reduction in emissions)

# Burn Wise Message


**Burn the right wood.** Save money and time. Burn only dry, seasoned wood and maintain a hot fire.

**The right way.** Keep your home safer. Have a certified technician install and annually service your appliance.

**In the right appliance.** Make your home healthier. Upgrade to an efficient, EPA-approved wood-burning appliance.

Burn Wise
Program of U.S. EPA


Burn Wise
Program of U.S. EPA

**www.epa.gov/burnwise**

# Overview of Key Draft Proposals

- Strengthen PM emission limits to reflect today's demonstrated Best Systems of Emission Reductions , considering costs
- Add efficiency standards to also reduce carbon monoxide emissions
- Include pellet stoves and single-burn rate appliances explicitly
- Include indoor and outdoor wood "boilers" (hydronic heaters) and wood-fired furnaces
- Revise test methods as appropriate

# Compliance & Enforcement Aspects

- Improve compliance assurance by streamlining the compliance audit process and conducting more inspections of labs and manufacturers and random audits
- Add electronic reporting by manufacturers and labs
- Add 3rd Party ISO-accredited laboratories to supplement assurance of the certification process
- Add compliance monitoring and enforcement activities by states and EPA Regional Offices (in addition to EPA Headquarters)
- Require emission tests on each type of fuel that manufacturer specifies/warrants for use
- Require that certification tests for pellet-burning devices use pellet fuels that are graded and licensed

**Expect to tighten emissions on new woodstoves to levels required in State of Washington**

**Expect to regulate new wood pellet stoves to emission levels required in State of Washington**

**Will still encourage changeout of wood stoves built before 1990**

# Expect to regulate…

## New Wood-fired Hydronic Heaters


## New Wood-fired Forced-air Furnaces

## New Masonry Heaters

## New Single-burn-rate Stoves

# Expect to require labeling for…

## New Cook Stoves

## New Coal-fired Stoves

## New Camp Stoves

# Expect to not regulate…

**Masonry (Site-built) and Manufactured Fireplaces**

**Chimineas**

**Pizza Ovens**

# Projected Impacts of Draft Proposal

- We expect the rule would reduce particle pollution by ~5,400 tons in 2018; many reductions would be in areas with particle pollution problems in NE and NW.
- Expect health benefits would be in the billions of dollars and lives would be saved.
- Expect that future costs would be less than $10 million per year.

# Potential $PM_{2.5}$ Emissions from New Units Sold
(tons/year in 5th year, 2018)

| Appliance | Baseline (Current NSPS) | Draft NSPS Revisions |
|---|---|---|
| EPA Certified Wood Stoves | 700 | 700 |
| Single-burn-rate Stoves | 1200 | 300 |
| Pellet Stoves | 250 | 250 |
| Indoor Forced-air Furnaces | 3900 | 970 |
| Hydronic Heaters (90% outdoor, 10% indoor) | 1700 | 80 |

# Previous Feedback from Public

- Many want us to propose the strongest standards as soon as possible, especially for hydronic heaters.
- Some want us to ban hydronic heaters.
- Some want us to propose wood stove standards tighter than Washington State's.
- Some want us to not set standards on residential heaters at all.
- Some want us to make the test methods stronger.
- Some want us to propose carbon monoxide emission limits, visible emission limits, and requirements for seasoned wood, energy audits, proper sizing, heat storage, and certified installers.

# Summary of current internal DRAFT

| APPLIANCE TYPE | KEY ASPECTS OF DRAFT (ALL EMISSION LIMITS BELOW ARE FOR PM UNLESS OTHERWISE SPECIFIED) | COMPLIANCE DEADLINES | COST EFFECTIVENESS (2008 $/T IN 2018/ 5TH YR) | ANNUALIZED COST-TO-SALES RATIOS (% IN 2018 / 5TH YR) | KEY ISSUES AND OTHER SIGNIFICANT POTENTIAL OPTIONS |
|---|---|---|---|---|---|
| Wood stoves | Tightens existing NSPS limits to match WA limits, i.e., 4.5 g of PM per hr (non-catalytic), 2.5 g/hr (catalytic).<br>Adds efficiency requirement of 70% to reduce CO. | "2014"<br>i.e., 1 year after expected effective date | N/A | N/A | Current NSPS limits are 7.5 g/hr (non-catalytic stoves) and 4.1 g/hr (catalytic stoves), however >85% of existing EPA-certified stoves currently meet WA limits. We are proposing test method improvements.<br>We expect to request comments and data to support other options for promulgation, e.g., establishing one limit of 2.5 g/hr for both non-catalytic and catalytic stoves. Cost-effectiveness of 2.5 g/hr option is estimated at $28,000/T, with annualized cost-to-sales ratio of 5.9% (potential Level 2). |
| Hydronic heaters | Level 1: 0.32 lb/mmBTU heat output with cap of 18 g/hr (matches Phase 2 of EPA voluntary program and NESCAUM model rule). Adds efficiency requirement of 75% to reduce CO.<br>Level 2: 0.15 lb/mmBTU heat output with cap of 7.5 g/hr and efficiency of 80%. | Option 1:<br>"2014" for outdoor and "2015" for indoor at Level 1 plus "2017" for Level 2 for both<br><br>Option 2:<br>Level 2 "immediately" | $2,200/T | 2.7% | Strong industry, states, public support for including HH in revised NSPS.<br>Proposing test method revisions.<br>We expect to request comments and data to support either of the co-proposed options or additional options for promulgation<br>Option 2 would achieve an additional emission reduction of 338 tons/year over the period of 2013-2015. The cumulative annualized costs would decrease by $300,000 for 2012-2014 because there would be a reduced number of models available for certification in those years. |
| Single-burn-rate stoves | 3.0 g/hr and 70% efficiency. | "2015"<br>(Level 1) | $1,400/T | 8.5% | Largest exemption for wood stoves in existing NSPS in terms of number of units sold (>40,000 units/year).<br>We expect to request comments and data to support additional options for promulgation, e.g., 2.5 g/hr. |

# Summary of current internal DRAFT, continued

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|---|---|---|---|---|---|
| Forced-air furnaces | 0.93 lb/mmBTU heat output (equivalent to Canadian level). | "2015" | $900/T | 3.2% | Emissions more significant than previously thought. Manufacturers want more time to develop improved best demonstrated systems of emission reduction (BSER). We expect to request data and comments to support additional options for promulgation, e.g., same levels as hydronic heaters to avoid competitive imbalance. |
| Pellet stoves | 4.5 g/hr (non-catalytic), 2.5 g/hr (catalytic) and 70% efficiency. Specifically include in NSPS; i.e., do not allow current exemption for appliances with >35:1 air-to-fuel ratio. | "2014" | N/A | N/A | Typically cleaner than wood stoves. Inclusion in NSPS reduces competitive imbalance versus wood stoves. Manufacturers generally want to be included in the NSPS. We expect to propose that emission tests use pellets that meet fuel quality standards developed by Pellet Fuel Institute. We expect to request data and comments to support additional options for promulgation, e.g., tighten the level in "2015" to 2.5 g/hr. Estimated cost-effectiveness of $60,000/T and cost-to-sales ratio of 0.97% (potential Level 2). |
| Masonry heaters | 0.32 lb/mmBTU heat output | "2015" | N/A | 22.3% | Strong support by some manufacturers for being included. We did not create a wood smoke partnership program because of low % of total wood smoke emissions We expect to request comments and data to support additional options for promulgation. |

# Summary of current internal DRAFT, continued

| APPLIANCE TYPE | KEY ASPECTS OF DRAFT (ALL EMISSION LIMITS BELOW ARE FOR PM UNLESS OTHERWISE SPECIFIED) | COMPLIANCE DEADLINES | COST EFFECTIVENESS (2008 $/T IN 2018 / 5TH YR) | ANNUALIZED COST-TO-SALES RATIOS (% IN 2018 / 5TH YR) | KEY ISSUES AND OTHER SIGNIFICANT POTENTIAL OPTIONS |
|---|---|---|---|---|---|
| Manufactured fireplaces (low mass) | Not included in this NSPS proposal due to concerns about national cost-effectiveness and potential economic impacts although local fireplace regulations may be cost-effective PM reductions strategies in some areas.<br>We expect to request comments on whether EPA should consider options in the future. | N/A | N/A | N/A | Some states want Federal regulations. Industry wants combination of EPA wood smoke partnership program and state/local rules where most needed.<br>We note that we considered a Level 1 option to set NSPS at current EPA partnership program level of 5.1 g/kg. (14 EPA-qualified models already meet this.) Estimated cost-effectiveness of $22K/T and cost-to-sales ratio of 5.8%.<br>We note that another option would be to not regulate now, but to tighten partnership program level. |
| Masonry fireplaces | Not included in this NSPS proposal due to concerns about national cost-effectiveness, impacts on small business masons, and the small percentage (10%) of total fireplaces. | N/A | N/A | N/A | We expect to encourage certification of masons by Mason Contractors Association of America. |
| Cook stoves | Only requires labeling, tighter definition. | "2013" | N/A | N/A | Less than 1000 new units per year.<br>We expect to request data and comments to support additional options for promulgation, e.g., standards similar to wood heaters. |
| Camp stoves | Only requires labeling. | "2013" | N/A | N/A | We expect to request data and comments to support additional options for promulgation, e.g., standards similar to wood heaters. |

# Summary of current internal DRAFT, concluded

| APPLIANCE TYPE | KEY ASPECTS OF DRAFT (ALL EMISSION LIMITS BELOW ARE FOR PM UNLESS OTHERWISE SPECIFIED) | COMPLIANCE DEADLINES | COST EFFECTIVENESS (2008 $/T IN 2018 / 5TH YR) | ANNUALIZED COST-TO-SALES RATIOS (% IN 2018 / 5TH YR) | KEY ISSUES AND OTHER SIGNIFICANT POTENTIAL OPTIONS |
|---|---|---|---|---|---|
| Native American bake ovens | Only includes definitions to clarify, focus exclusions | N/A | N/A | N/A | We conducted tribal outreach and consultation. |
| Native American ceremonial fires | Only includes language to clarify that such fires are excluded | N/A | N/A | N/A | We conducted tribal outreach and consultation. |
| Coal stoves | Only includes labeling. Emission limits not included in this NSPS proposal due to insufficient data on best systems of emission reduction for various types of coal.<br>We expect to request comments and data that may help EPA consider other options in the future. | N/A | N/A | N/A | Significant emission concerns for areas that have access to cheap/free coal<br>No emission test data for various types of coal. |
| Outdoor fireplaces, chimineas, pizza ovens | Not included due to lack of data on best systems of emission reduction.<br>We expect to request comments and data that may help EPA consider options in the future. | N/A | N/A | N/A | No test data |

# Questions?